

(5.5) Solving Problems Using Quadratic Relations

1. Convert to **standard form**:

a) $y = -(x+4)^2 + 10$

$y = -[(x+4)(x+4)] + 10$

$y = -[x^2 + 4x + 4x + 16] + 10$

$y = -[x^2 + 8x + 16] + 10$

$y = -x^2 - 8x - 16 + 10$

$y = -x^2 - 8x - 6$

b) $y = 3(x-5)^2 - 7$

$a = -1$
 $(-4, 10)$
 $h = -4, k = 10$

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(5.5) Solving Problems Using Quadratic Relations

1. Convert to **standard form**:

a) $y = -(x+4)^2 + 10$

$y = -(x+4)(x+4) + 10$

$y = -(x^2 + 4x + 4x + 16) + 10$

$y = -(x^2 + 8x + 16) + 10$

$y = -x^2 - 8x - 16 + 10$

$y = -x^2 - 8x - 6$

b) $y = 3(x-5)^2 - 7$

$y = 3(x-5)(x-5) - 7$

$y = 3(x^2 - 5x - 5x + 25) - 7$

$y = 3(x^2 - 10x + 25) - 7$

$y = 3x^2 - 30x + 75 - 7$

$y = 3x^2 - 30x + 68$

$h = -4, k = 10$
 $a = -1$
Standard Form
 $h = -4, k = 10$
 $a = -1$
 $(h, k) = (-4, 10)$
 $a = -1$

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2. Find the equation, in **vertex form**, if the zeros are -2 and 10 and the y-intercept is 5.

$y = a(x-r)(x-r)$
 $y = a(x+2)(x-10)$

For vertex form we need: $\frac{-2+10}{2} = 4$

When we have the zeros, we start with **factored** form.

$5 = a(0+2)(0-10)$

$5 = a(2)(-10)$

$5 = -20a$

$a = -\frac{1}{4}$

$y = -\frac{1}{4}(x+2)(x-10)$

$y = -\frac{1}{4}(x^2 - 8x - 20)$

$y = -\frac{1}{4}x^2 + 2x + 5$

$y = -\frac{1}{4}(x-4)^2 + 9$

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2. Find the equation, in **vertex form**, if the zeros are -2 and 10 and the y-intercept is 5.

$y = a(x-r)(x-r)$
 $y = a(x+2)(x-10)$

For vertex form we need: $\frac{-2+10}{2} = 4$

When we have the zeros, we start with **factored** form.

$\frac{5+r}{2} = \frac{-2+10}{2} = 4$

$y = -\frac{1}{4}(x+2)(x-10)$

$y = -\frac{1}{4}(x^2 - 8x - 20)$

$y = -\frac{1}{4}x^2 + 2x + 5$

$y = -\frac{1}{4}(x-4)^2 + 9$

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Homework/Classwork:

Pg. 293 # 4 to 6 ac, 7, 9-10 ac, 15, 16

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